

What is claimed is:

1. A method to prevent rusting and general oxidation for metals and nonmetals to create novel passive materials resistive to general oxidation reactions, comprising:
Providing raw substances and processes needed to form a known material;
Incorporating a predetermined amount of long-life beta emitters during said processes of making said material;
Whereby a new material with lasting anti-oxidation capability, via naturally supplying electrons needed for achieving cathodic protection, is produced.
2. The method of claim 1 wherein the novel passive materials resistive to general oxidation reactions cover metals, including pure metals, alloys, such as steels; and nonmetals, including, ceramics, biochemical substances, polymers; and composites.
3. The method of claim 1 wherein the beta emitters can be selected from the long half-life group including nickel-63, cadmium-113, and technetium-99.
4. The method of claim 1 wherein the novel passive materials resistive to general oxidation reactions are cast irons and steels employed in manufacturing objects including ship hulls, automobile bodies and parts, underground equipments, reinforcing steels in concrete, and iron bridges.
5. The method of claim 4 wherein the objects contain an amount of nickel-63 ranging from 0.001 μg to 100 g, as

necessitated by each specific condition.

6. The method of claim 1 wherein the novel passive materials resistive to general oxidation reactions take the form of eutectics used in welding and filling industry.
7. The method of claim 1 wherein the novel passive materials resistive to general oxidation reactions are ceramics manufactured into the form of containers for high temperature caustic solutions.
8. The method of claim 1 wherein the novel passive materials resistive to general oxidation reactions are biomaterials adopted for use in making anti-corrosion devices to be implanted within human bodies, such as artificial knee, leg and pacemaker.
9. The method of claim 8 wherein the risk of causing allergy on patients as a result of diffusion of said beta emitters, especially nickel-63, from said anti-corrosion devices is minimized by coating said anti-corrosion devices with materials such as cobalt-chromium alloy and titanium alloy, as described in Embodiment 4.
10. The method of claim 1 wherein the novel passive materials resistive to general oxidation reactions serve as sealing-off packaging materials for products including metals, foods, medicine, and pharmaceuticals, by compromising oxidants in vicinity before their entering into and attacking said products.
11. The method of claim 10 wherein the sealing-off packaging

materials can be composed of substances selected from the group including paper, polymer, metal, glass, composite, and ceramic.

12. The method of claim 1 wherein the novel passive materials resistive to general oxidation reactions serve as anti-mold and anti-germ packaging materials for products including foods, medicine, and pharmaceuticals, by hindering vital oxidation reactions within microorganisms such as mold, mildew and germ.
13. The method of claim 1 wherein the novel passive materials resistive to general oxidation reactions are employed as anti-metabolites to impede microbial metabolism and hence microbial adhesion and corrosion on products intended for anti-oxidation protection.
14. A method to prevent rusting and general oxidation for metals and nonmetals to produce novel anti-rust coating materials, including paints, lacquers, comprising:
 - Providing a coating material;
 - Adding a predetermined amount of beta emitters into said coating material;
 - Whereby a new coating material capable of providing rust prevention, via spontaneously supplying electrons needed for achieving cathodic protection on surfaces of chosen materials such as iron, is produced.
15. The method of claim 14 wherein the beta emitters can be

selected from the long half-life group including nickel-63, cadmium-113, and technetium-99.

16. The method of claim 14 wherein the beta emitters are prepared in fine powder form, each powder of diameter less than 100 μm , prior to being incorporated into said coating material.
17. The method of claim 14 wherein the coating material is nitric acid, prior to dissolving said beta emitters.
18. The method of claim 14 wherein the new coating material is applied in existing surface treatment practices including brush painting, spray coating, electro-deposition, electroless deposition, diffusion coating, anodizing, electro-plating and powder coating.
19. The method of claim 14 wherein the new coating material is applied as anti-metabolite on microbes adhering to structures intended for anti-microbial protection, such as ship hulls, by interfering with microbial metabolism and hence expelling these microbes.
20. The method of claim 14 wherein the new coating material is applied as anti-mold and anti-germ surface covering for products and environments including furniture, refrigerators, tiles, and cargo chambers, by hindering vital oxidation reactions within microorganisms including mold, mildew and germ.